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Xylaria nelumboniformis sp. nov. from tropical China

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Abstract—A new pyrenomycetous fungus from the tropical forest of Hainan Province, southern China, *Xylaria nelumboniformis,* is described and illustrated. The new species is characterized by having lotus-leaf shaped fertile stromatal apices, a flattened surface with conspicuously tomentose edges, and navicular to crescent-shaped ascospores (23–27.5 × 7.5–9 µm) with a short oblique germ slit.

Key words—*Ascomycota,* taxonomy, *Xylariaceae*

Introduction

Wood-rotting fungi are an important component of forest ecosystems, where they decompose forest litter and maintain energy flow and material circulation (Lonsdale et al. 2008). Most *Xylaria* species produce stromata on decayed wood (Dennis 1956, Martin 1970, Rogers et al. 1987, Læssøe 1987, Van der Gucht 1995, Ju & Rogers 1999, San Martín et al. 2001, Ju et al. 2009, Hsieh et al. 2010, Fournier et al. 2011, Fournier 2014), and they are critical for maintaining species diversity of these ecosystems (Rogers 1979, 2000; Whalley 1996; Osono et al. 2011). New *Xylaria* species and records have been described after recent investigations on wood-rotting fungi in subtropical and tropical forests in China (Ma et al. 2011, 2012, 2013a,b,c). This paper reports a new species of *Xylaria* based on two specimens on the dead tree stump during a survey of xylariaceous fungi in southern China. They differ morphologically

from existing *Xylaria* species, so we describe and illustrate them as a new species.

Materials & methods

Voucher specimens are deposited in the Fungarium of Institute of Tropical Bioscience and Biotechnology, Chinese Academy of Tropical Agricultural Sciences, Haikou, China (FCATAS). Microscopical features and measurements were determined from tissues mounted in water and Melzer's iodine reagent. The photographs of asci, ascal apical ring, and ascospores were taken using a Keyence VHX-600E microscope, and photographs of the stromatal surface were taken with a S70 Canon camera attached to a ZSA30w microscope.

Taxonomy

Xylaria nelumboniformis Hai X. Ma, Lar.N. Vassiljeva & Yu Li, **sp. nov.** Figs 1, 2

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Differs from *Xylaria psamathos* by its tomentose stromata, larger ascospores, and short oblique germ slit.

Type: China, Hainan Province: Diaoluoshan Natural Reserve, 18°46′N 109°50′E, alt. 500 m, on dead stump, 10 Nov. 2012, Haixia Ma, Col. 16 (**Holotype**, FCATAS 547).

Etymology: The epithet refers to the "lotus leaf" shape of the fertile part of the stromata.

Stromata unbranched, upright, with applanate surface of fertile apices, 4–22 mm tall overall, short or long stipitate; fertile parts 4–10 mm diam. × 1.5–3 mm thick, nearly lotus leaf-shaped to irregularly discoid, externally greyish-black to black, with greyish-white sloughing scales and tomentose, especially on the edges; surface plane or with inconspicuous perithecial mounds, finely cracked and tomentose, internally white, woody, texture hard. Stipes 1.5–18 × 1–1.5 mm, terete, inconspicuously tomentose, sometimes contorted, arising from a slightly enlarged base. Perithecia subglobose, 600–900 μm diam. Ostioles slightly prominent. Asci eight-spored, uniseriate, cylindrical, long-stipitate, (180–)190–240(–260) μm long overall, the spore-bearing parts 150–170 × 9–10 μm, the stipes 30–110 μm long, with apical apparatus bluing in Melzer's reagent, urn-shaped to nearly rectangular, (8–)10–12(–15) × 4–5 μm. Ascospores brown to dark brown, unicellular, ellipsoid-inequilateral to navicular to crescent-shaped, with narrowly to broadly rounded ends, smooth, (21.5–)23–27.5(–31.5) × (7–)7.5–9(–10) μm, with short oblique germ slit.

Additional specimen examined: **CHINA, Hainan Province: Diaoluoshan Natural Reserve**, 18°46′N 109°50′E, alt. 500 m, on dead stump, 12 Jul. 2013, Haixia Ma (FCATAS 612).

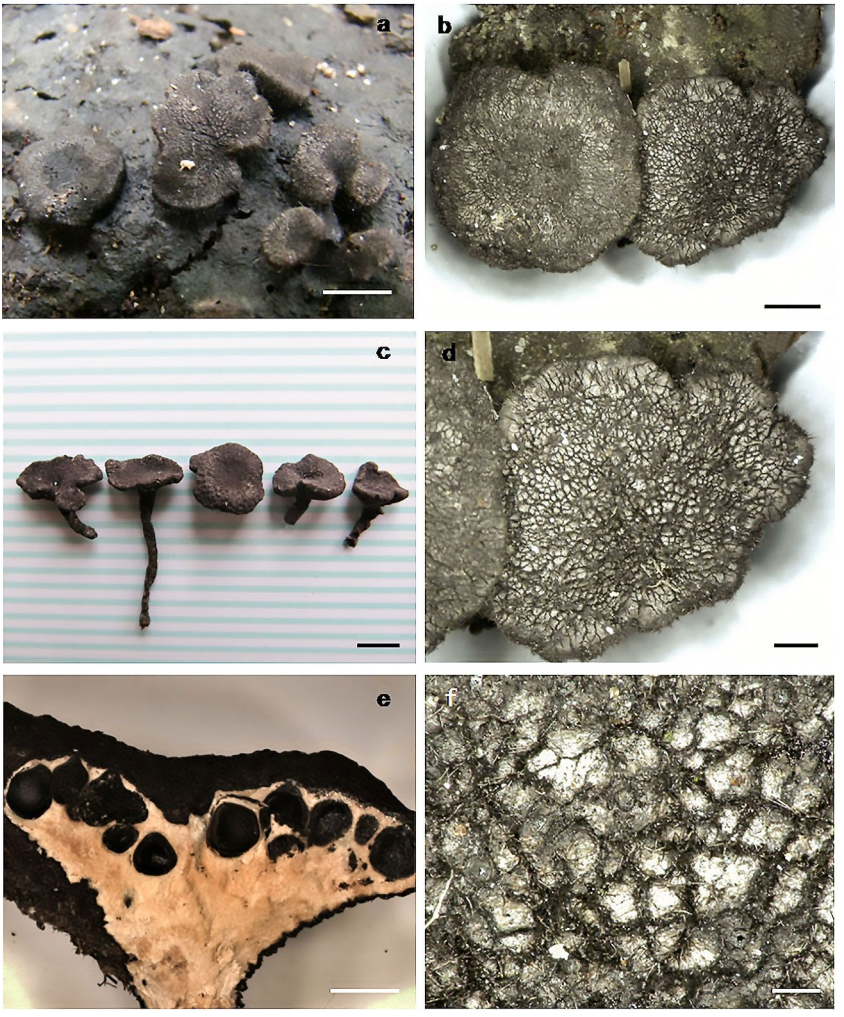

Fig. 1. *Xylaria nelumboniformis* (holotype, FCATAS 547). a–c. Stromata; d, f. Stromatal surface; e. Mature stroma in vertical section. Scale bars: a, c = 6 mm; b = 2 mm; d, e = 1 mm; f = 0.2 mm.

Comments —*Xylaria nelumboniformis* is easily separated from other *Xylaria* species by its lotus-leaf shaped or irregularly discoid flattened stromata that are conspicuously tomentose on the edges. This species is strikingly similar in stromatal morphology to *X. psamathos* Boise, which differs by its smooth

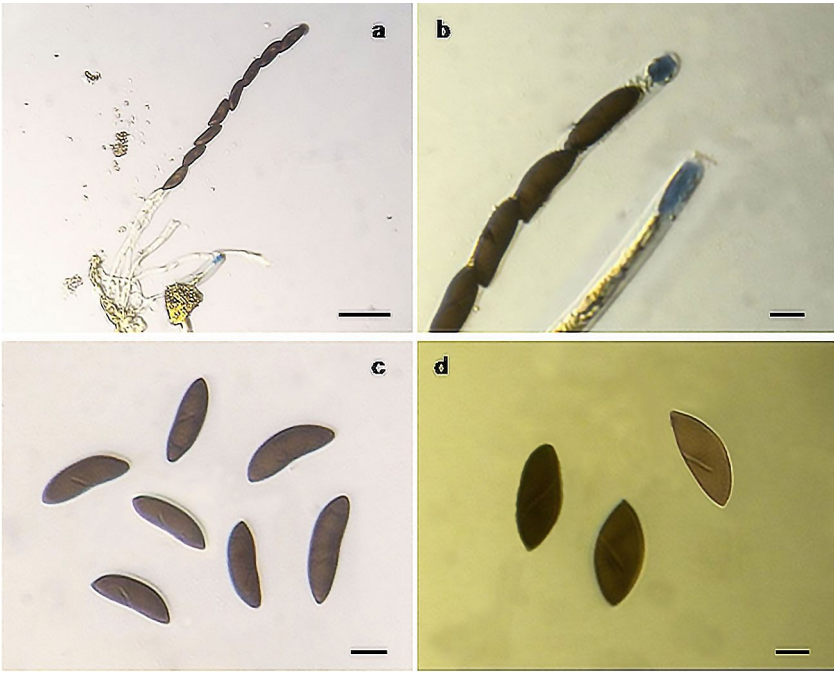

Fig. 2. *Xylaria nelumboniformis* (holotype, FCATAS 547). a. Asci and paraphyses; b. Ascus apical ring; c. Ascospores; d. Germ slit. Scale bars: a = 40 μm; b, c = 10 μm; d = 8 μm.

stromata, its smaller ascospores (11–13 × 4–6 μm) with a straight germ-slit extending the full length of the spore, its flattened-cylindrical ascus rings, and its habitat (dead grass culms in a North Carolina saltmarsh; Boise 1982).

Xylaria nelumboniformis is somewhat similar to *X. crozonensis* P. Leroy & Mornand and *X. michoacana* F. San Martín et al. in stromatal morphology, but *X. crozonensis* has cracked smooth stromata that are narrowly connected to the substrate and smaller ascospores (13.3–15.6 × 7.6–8.8 μm) with a straight inconspicuous germ slit (Leroy & Mornand 2004, Fournier 2014). *Xylaria michoacana* is distinguished by cracked smooth stromata that are narrowly connected to the substrate and slightly smaller subglobose ascospores (21.5–24.5 × 14–16 μm; San Martín et al. 2001).

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